DETAILED ACTION

Status of Application, Amendments, and/or Claims

Applicants' amendment filed upon 09/30/2009 has been entered in full. Claims 55, 64, and 69 are amended. Claim 94 is added. Claims 51-94 are pending. Claims 55-59, 63-66, 69, and 94 are currently under consideration. All other claims are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention or species.

Withdrawn Objections and/or Rejections

The rejection of claims 64-66 and 69 under 35 U.S.C. 112, second paragraph is withdrawn in view of amended claims.

The rejection of claims 55-59 and 63 under 35 U.S.C. 102 (b) as being anticipated by Poul et al. (Journal of Biomolecular Screening 7 (1):57-61, 2002) is withdrawn in view of amended claim 55 and Applicants argument's that the cited prior art does not teach construction of an expression vector containing a fusion protein comprising at least one Ca2+-sensitive recombinant aequorin protein condensed with at least one cellular effector, or a combination of at least one cellular effector and at least one signal sequence.

The rejection of claims 64 and 65 under 35 U.S.C. 103(a) as being unpatentable over Poul et al. (Journal of Biomolecular Screening 7 (1):57-61, 2002) is withdrawn in view of amended claim 55, from which claims 64 and 65 depend from.

The rejection of claims 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poul et al. (Journal of Biomolecular Screening 7 (1):57-61, 2002) in view of Langer et al. (Molecular Endocrinology 16(5):1089-1096, 2002) is with drawn in view of amended claim 55, from which claim 66 depends from.

The objection to claim 55 is withdrawn in view of amended claim.

Claim Rejections under 35 USC § 103(a)

(i). The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

(ii). Claims 55-59, 63-65, 69, and 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poul et al. (Journal of Biomolecular Screening 7 (1):57-61, 2002) in view of Marsault et al. (The EMBO Journal 16:1575-1581, 1997).

Poul et al. teach a cellular aequorin-based high throughput screening of G protein-

coupled receptors (GPCRs). CHO-K1 cells were transfected with a plasmid encoding the apoaequorin gene with a mitochondrial targeting signal and Gα16 (page 58, under Stable aequorin cell line). The CHO-K1 cells were also transfected with expression plasmids encoding three different human GPCRs, melanin-concentrating hormone type 1 receptor (MCH1), orexin type 2 receptor (O_{x2}), and serotonin type 2B receptor (5-HT_{2B}); page 58, under section of GPCRs in aequoscreen cell lines). The cells are loaded with the apoaequorin cofactor coelenterazine, diluted in assay buffer, and injected into plates containing the samples to be tested. The results were expressed as relative light units (Abstract; page 58, under the section of Aequorin assays).

Poul et al. do not explicitly teach that an expression vector encoding a fusion protein comprising a Ca2+-sensitive aequorin and a cellular effector.

Marsault et al. teach construction of an expression vector encoding a fusion protein comprising aequorin and SNAP-25 (a neuronal protein which is recruited to the plasma membrane after the post-translation addition of a lipid anchor) and expression of the fusion protein in a rat aortic smooth muscle cell line (see, e.g., Abstract).

It would have been obvious for one of skill in the art to modify the method of Poul et al., as a choice, to transfect the cells with an expression vector encoding a fusion protein comprising aequorin and SNAP-25 (in stead of the apoaequorin with a mitochondrial targeting signal) to screen an agonist of a GPCR with a reasonable expectation of

success. One would be motivated to do so because such a fusion protein can be used to monitor the Ca2+ concentration of the cytoplasmic rim beneath the plasma membrane, which is > fold higher than those of the bulk cytosol, upon activation of Ca2+ influx through plasma membrane channels as taught by Marsault et al. (se, e.g., Abstract).

(iii). Claims 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poul et al. (Journal of Biomolecular Screening 7 (1):57-61, 2002) in view of Marsault et al. (The EMBO Journal 16:1575-1581, 1997) as applied to claims 55-59, 63-66, and 94 above, and further in view of Langer et al. (Molecular Endocrinology 16(5):1089-1096, 2002).

Poul et al. and Marsault et al. teach a cellular aequorin-based high throughput screening of G protein-coupled receptors (GPCRs), as applied to claims 55-59, 63-66, and 94 above.

Poul et al. and Marsault et al. teach that a cell line of b) of claim 55 is previously engineered so as to express a chimeric receptor as recited in claim 66.

Langer et al. teach construction of a chimeric human VPAC1/VPAC2 GPCR, expression of the chimeric receptor in CHO cells co-expressing aequorin, and measurement of VIP-mediated calcium increase by a functional assay based on the luminescence produced after coelenterazine oxidation (Abstract, page 1089, right column, the 2nd paragraph).

It would have been obvious for one of skill in the art to transfect the cells with an expression vector encoding a chimeric GPCR and to screen an agonist of the chimeric GPCR using a cellular aequorin-based high throughput screening method taught by Poul et al. and Marsault et al. with a reasonable expectation of success. One would be motivated to do so because a chimeric receptor, such as a chimeric GPCR, can be used to study the structure/activity of a chimeric receptor as taught by Langer et al. (Table 1, Fig. 2, page 1089, right column, the 2nd paragraph).

Claim Objection—Minor Informalities

Claims 58 and 65 are objected to because they recite non-elected species. Appropriate correction is required.

Conclusion

No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Advisory Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruixiang Li whose telephone number is (571) 272-0875. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Nickol, can be reached on (571) 272-0835. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, please contact the Electronic Business Center (EBC) at the toll-free phone number 866-217-9197.

/Ruixiang Li/

Primary Examiner, Art Unit 1646

Ruixiang Li, Ph.D.
January 10, 2010